



Northern States Power Company

Monticello Nuclear Generating Plant
2807 West Hwy 75
Monticello, Minnesota 55362-9637

December 22, 1997

10 CFR Part 50
Section 50.73

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

LER 97-013
Manual Scram Inserted Due to Loss of Condenser Vacuum
Caused By Electrical Fault Tripping Recombiners

The Licensee Event Report for this occurrence is attached. This report contains two new NRC commitments:

The temporary cables feeding the Offgas Storage Building will be replaced with permanent underground cables.

An evaluation of the action necessary to ensure the proper functioning of existing plant underground cables will be conducted.

Please contact Tom Parker at (612) 295-1014 if you require further information.

Michael F Hammer
Plant Manager
Monticello Nuclear Generating Plant

c: Regional Administrator - III NRC
Sr Resident Inspector, NRC
NRR Project Manager, NRC
State of Minnesota, Attn: Kris Sanda

Attachment

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CATEGORY 1

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SUBJECT: **Forwards LER 97-013-00**,re manual scram inserted due to loss
of condenser vacuum.Caused by electrical fault tripping
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NRC FORM 366 (4-96)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104 EXPIRES 4/30/98								
LICENSEE EVENT REPORT (LER)													
<small>(See reverse for required number of digits/characters for each block)</small>													
FACILITY NAME (1) MONTICELLO NUCLEAR GENERATING PLANT					DOCKET NUMBER (2) 05000 - 263			PAGE (3) 1 OF 5					
TITLE (4) Manual Scram Inserted Due to Loss of Condenser Vacuum Caused By Electrical Fault Tripping Recombiners													
EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)				
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER			
11	25	97	97	013	00	12	22	97	FACILITY NAME	DOCKET NUMBER			
OPERATING MODE (9)		N		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10)		100 %		20.402(b)		20.405(c)		<input checked="" type="checkbox"/> 50.73(a)(2)(iv)		73.71(b)			
				20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)			
				20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER			
				20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		<small>(Specify in Abstract below and in Text, NRC Form 366A)</small>			
				20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)					
				20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)					
LICENSEE CONTACT FOR THIS LER (12)													
NAME Tom Parker					TELEPHONE NUMBER (Include Area Code) 612-295-1014								
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)													
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS			
SUPPLEMENTAL REPORT EXPECTED (14)													
YES <small>(IF YES, COMPLETE EXPECTED SUBMISSION DATE)</small>					<input checked="" type="checkbox"/> NO					EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

ABSTRACT LIMIT TO 1400 SPACES, I.E., APPROXIMATELY 15 SINGLE-SPACED TYPEWRITTEN LINES) (16)
NCR FORM 366 (4-95)

Control room operators received alarms from the tripping of two 480V load center breakers. Each breaker fed one division of the Offgas Recombiners and the Offgas Compressors plus associated equipment. Loss of the Condenser Offgas System, specifically the recombining, caused condenser vacuum to decrease. Control Room operators decreased reactor power to reduce the rate of loss of condenser vacuum. Engineering and operations personnel determined that the breakers had tripped on short circuit. Since it would not be possible to re-energize the offgas recombining, condenser vacuum would continue to decrease. Control room operators conservatively manually scrambled the reactor (inserting the control rods).

A cross-divisional cable fault caused the two 480V load center breakers to trip.

Temporary cables were installed primarily above ground. The temporary cables feeding the Offgas Storage Building will be replaced with permanent underground cables. An evaluation of the action necessary to ensure the proper functioning of existing plant underground cables will be conducted.

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PDR ADOCK 05000263
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NRC FORM 366A COMMISSION (5-92)		U.S. NUCLEAR REGULATORY		
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION		APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95		
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.				
FACILITY NAME(1)	DOCKET NUMBER (2)	LER NUMBER (6)		PAGE (3)
MONTICELLO NUCLEAR GENERATING PLANT	05000 263	YEAR 97	SEQUENTIAL NUMBER 013	REVISION NUMBER 00
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Description

On November 25, 1997, control room operators received alarms from the tripping of two 480V load center breakers¹. Each breaker fed one division of the Offgas Recombiners² and the Offgas Compressors³ plus associated equipment (see attached sketch). Loss of the Condenser Offgas System, specifically the recombiners, caused condenser vacuum to decrease. Control Room operators decreased reactor power to reduce the rate of loss of condenser vacuum. Engineering and operations personnel determined that the breakers had tripped on short circuit. Since it would not be possible to re-energize the offgas recombiners, condenser vacuum would continue to decrease. Control room operators conservatively manually scrammed the reactor (inserting the control rods).

Sequence of Events:

Time	Plant Sequence of Events
Initial Conditions	100% reactor power 27" Hg condenser vacuum 35" reactor water level 480V load center breakers 52-110 and 52-206 were closed.
1459	480V load center breakers 52-110 and 52-206 tripped on short circuit.
1500	Condenser vacuum begins to decrease.
1501	Control room operators begin reducing reactor power by decreasing recirculation pump speed.
1505	Reactor power reaches approximately 55%.
1510	Condenser vacuum decreases to approximately 25.5" Hg.
1510	Manual Reactor Scram (automatic low condenser vacuum reactor scram would occur at 23.1" Hg).
1510	Reactor Water Level reaches its minimum of approximately 2". Since water level was below 9", a containment isolation (Group II and III) occurred. Although this is a normal occurrence following a reactor scram, Emergency Operating Procedures were required to be entered.
1516	Reactor Water Level restored to normal.
1522	Group III isolation reset.
1536	Group II isolation reset.
1548	Emergency Operating Procedures exited.

¹ EIIS System Code: EC and EIIS Component Code: BKR

² EIIS System Code: WF

³ EIIS System Code: WF

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Cause

The computer records show that both breakers tripped at the same time. The breakers are located on different elevations. Short circuit flags were activated on both breakers. These facts indicate that a common fault tripped the breakers.

The location of the electrical fault could not be determined. Cables⁴ from both of these breakers supplied non-safety related equipment in the Offgas Storage Building. They traveled underground from the Turbine Building to the Offgas Storage Building (over 1000 ft in length). A problem with the underground cabling was suspected. The cables are not fully separated when underground, allowing a cross division fault. The following actions were taken:

All switch gear and loads were inspected and meggered. No problems were found that could have caused the fault.

The load center breakers that tripped, were inspected and tested. The breakers were found to be working normally.

The cables were excavated at several locations. No problems were found.

Extensive testing of the cables was performed.

The testing could not determine the location of the fault. No reduced resistance was found between the two divisional cables. No low resistance, representative of a fault, could be measured between the cables and ground. However, the sandy soil around the plant can provide excellent resistance in the absence of water.

The cause is assumed to be a cross divisional fault in the underground section of the cables. The energy released during the fault (6,000 amperes) must have eliminated the fault by vaporizing moisture and/or the part of the conductor.

Analysis of Reportability

This event is being reported per 10 CFR Part 50, Section 50.73(a)(2)(iv) since this was a manual actuation of the reactor protection system.

⁴ EIS Component Code: CBL4

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Safety Significance

This event challenged the reactor protection system and the containment isolation system. The reactor protection system properly shutdown the reactor and all safety systems performed properly. For these reasons, this event had no effect on the health and safety of the public.

Actions

Corrective Actions

Temporary cables were installed primarily above ground. Where vehicular traffic was required, the cables were buried in conduit. The temporary cables feeding the Offgas Storage Building will be replaced with permanent underground cables.

Preventive Actions

An evaluation of the action necessary to ensure the proper functioning of existing plant underground cables will be conducted.

Failed Component Identification - None

Similar Events -

No previous reportable similar events have occurred. However, there have been several past faults in underground cables.

The cause of LER 84-013, "Emergency Diesel Generator Auto Start Due to Fault on No. 1AR XFMR Cable Primary", was associated with water in a cable pothead and not related to this event.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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Sketch of Fault Location

